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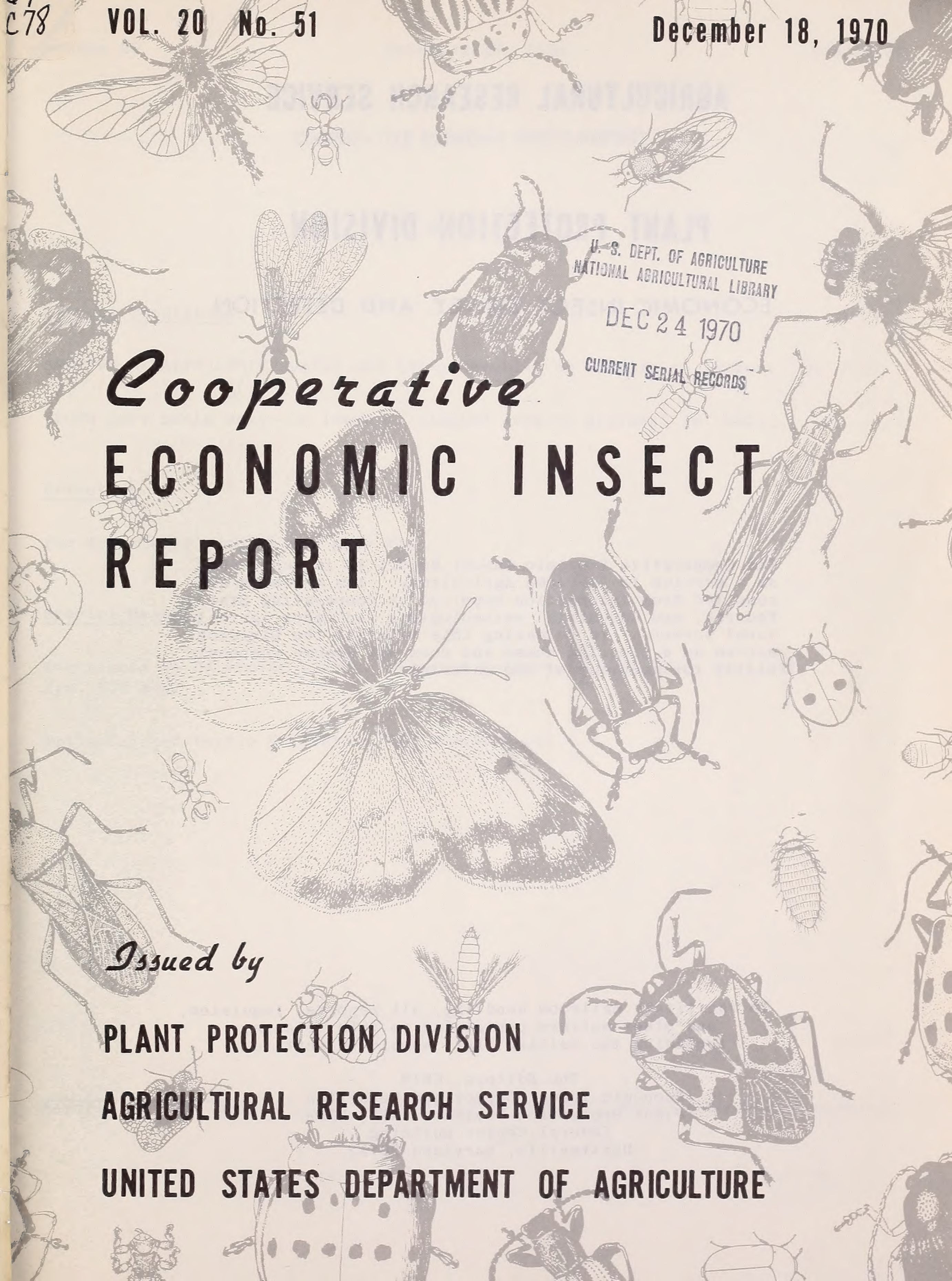
VOL. 20 No. 51

December 18, 1970



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Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PROTECTION DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PROTECTION DIVISION

ECONOMIC INSECT SURVEY AND DETECTION

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

To facilitate mailroom handling, all reports, inquiries, and other matters pertaining to this release, including the mailing list, should be sent to:

The Editors, CEIR
Economic Insect Survey and Detection
Plant Protection Division, ARS, USDA
Federal Center Building
Hyattsville, Maryland 20782

Volume 20 December 18, 1970 Number 51

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

SPOTTED ALFALFA APHID number one insect problem on alfalfa in Arizona. (p. 831).

BROWN SOFT SCALE heavy on lemon in limited area of Arizona. (p. 832).

Detection

For new county records see page 833.

Special Reports

Techniques to Determine Losses. Selected References 1967-1970. Part VII. (pp. 835-836).

White-Fringed Beetle Quarantine Map. Centerfold.

Reports in this issue are for week ending December 11 unless otherwise indicated.

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White-Fringed Beetle Quarantine. Map. Centerfold.

WEATHER OF THE WEEK ENDING DECEMBER 14

HIGHLIGHTS: Winter cold prevailed along our northern border. It was especially cold from Pennsylvania to New England. Mild temperatures predominated from Texas to Virginia. Heavy snow fell from Great Lakes to New England.

PRECIPITATION: Fair weather continued over most of the Nation early in the week. The exception included light precipitation from the northern and central Pacific coast to the northern Rocky Mountains, and from the Great Lakes to the Northeast. For the most part, precipitation was sparse in the first half of the week although a blanket of fog covered central Oklahoma and much of Louisiana Wednesday morning. A change of weather pattern began to take shape about midweek. Moist Pacific air invaded the northern Rocky Mountains. As the storm system moved to the Great Lakes, another system brought mixtures of snow, sleet, and freezing rain, creating hazardous driving conditions across Upstate New York and northern New England. A foot of fresh snow fell at Massena, New York, increasing the depth at that location to 20 inches by early Wednesday evening, and by early Thursday 23 inches lay on the ground. By late Thursday, a major storm was sweeping across the Great Plains. Several inches of snow fell from northeastern Nebraska to southern Minnesota, and by Friday, the snow had spread eastward to the Great Lakes. A band of rain and freezing rain lay south of the snow belt. Showers and thunderstorms occurred in the middle Mississippi River Valley. The weekend brought inclement weather from the Great Lakes to the Atlantic coast. Heavy snow fell in the northern portion of that area. Madison, Wisconsin, received 16 inches, the greatest 24-hour amount and the greatest storm total of record for that station. Freezing rain coated wires, trees, and streets south of the snow area. Rain fell further south, but parts of the Deep South received no rain. Some areas in Georgia received rain on Saturday after three weeks of dry weather. Forest fire danger increased in the rainless areas. By late Sunday, snow fall intensity was decreasing in the Northeast, but a Pacific storm was approaching the western coast.

TEMPERATURES: Fair weather prevailed over most of the Nation early in the week. Monday afternoon temperatures in the 60's were common in mid-America as far north as Nebraska. Montana and North Dakota registered maximums in the 40's. The Northeast was cool with afternoon readings near freezing. In the Southwest, the mercury approached the 80° mark with 82° at Thermal, California, and at Tucson, Arizona. Subzero temperatures occurred in northern Maine Tuesday morning. The warming trend continued in mid-America with Grand Island, Nebraska, recording 73° Tuesday afternoon. Cooler air moved into the northern Great Plains Wednesday when much of Montana and the Dakotas remained below freezing. The East warmed at midweek. Washington, D.C., was about 20° warmer on Saturday afternoon than 24 hours earlier. Weather of the week continued on page 834.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

GREENBUG (Schizaphis graminum) - NEW MEXICO - Generally light, up to 4 per linear foot, on irrigated wheat checked in Curry County. (N.M. Coop. Rpt.). Ranged 4-15 per linear foot of barley in Chaves County. (Mathews). OKLAHOMA - Averaged 110 per linear foot of wheat in Custer and Washita Counties December 1, and 20 per linear foot in Kiowa and Jackson Counties December 4. Currently ranged 5-25 per linear foot of wheat in Muskogee County and 10-50 per linear foot of barley in Walters area of Cotton County. (Okla. Coop. Sur.). ARKANSAS - Survey remains negative in northwest areas. (Boyer).

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARIZONA - Counts per 100 sweeps of alfalfa in Yuma County: 1,350 in seedling fields in Parker Valley; in established fields - 3,080 in Bouse area, 425 in Parker Valley, and 1,220 in Yuma Valley. Remains number one insect problem. (Ariz. Coop. Sur.).

CORN LEAF APHID (Rhopalosiphum maidis) - OKLAHOMA - Averaged 20 per linear foot of wheat in Custer and Washita Counties December 1. (Okla. Coop. Sur.).

CORN, SORGHUM, SUGARCANE

WESTERN BEAN CUTWORM (Loxagrotis albicosta) - SOUTH DAKOTA - Moths collected from blacklight traps at Spearfish, Lawrence County; Lakota Peak Lookout, Pennington County; Milesville, Haakon County; Cottonwood, Jackson County; and at LaCreek (Martin), Bennett County, in 1970. These are new county records. Moth numbers increased over 1969 collections. Earliest 1970 collection July 7 at Lakota Peak Lookout, latest August 8 in Fall River County. Majority collected between July 24 and August 2. (Calkins, Jones).

SMALL GRAINS

YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) - CALIFORNIA - Averaged one larva per leaf on barley at Chino, San Bernardino County. (Cal. Coop. Rpt.).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Ranged up to 250 per linear foot of wheat in Kiowa and Jackson Counties. Wheat in poor condition in this area due to lack of moisture. Many fields turning brown. (Okla. Coop. Sur.).

FORAGE LEGUMES

ALFALFA CATERPILLAR (Colias eurytheme) - ARIZONA - Larvae 40 per 100 sweeps in field of alfalfa in Yuma Valley, Yuma County. (Ariz. Coop. Sur.).

THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) - ARIZONA - Counts per 100 sweeps in alfalfa averaged 125 at Parker Valley and Bouse, 300 at Yuma, Yuma County. (Ariz. Coop. Sur.).

PEA APHID (Acyrthosiphon pisum) - NEW MEXICO - Light, ranged 2-20 per square foot, in alfalfa in most Chaves County fields. (Mathews). ARIZONA - Average per 100 sweeps of alfalfa as follows: 175 at Yuma, Yuma County, and 750 at Cochise, Cochise County. (Ariz. Coop. Sur.).

CITRUS

Insect Situation in Florida - End of November - CITRUS RUST MITE (Phyllocoptruta oleivora) infested leaves in 88 (norm 68) percent of groves; 72 (norm 47) percent economic. Infested fruit in 86 (norm 68) percent of groves; 69 (norm 48) percent economic. Population decreased for first time in 2 months. Highest in 19 years for late November. Will remain in high range on leaves and fruit despite further substantial decrease. All districts high. CITRUS RED MITE (Panonychus citri) in 37 (norm 32) percent of groves; 12 (norm 9) percent economic. Slightly above normal but in low range. Little change expected. Highest districts south and central. TEXAS CITRUS MITE (Eutetranychus banksi) in 35 (norm 33) percent of groves; 11 (norm 14) percent economic. Near normal and low. Slight decrease expected. Highest districts central and north. GLOVER SCALE (Lepidosaphes gloverii) in 86 (norm 66) percent of groves; 7 (norm 12) percent economic. PURPLE SCALE (L. beckii) in 77 (norm 64) percent of groves; 3 (norm 6) percent economic. Glover scale and purple scale above normal and at moderate population levels. Little change expected. Highest districts for Glover scale are south, north, and west. Highest district for purple scale is central. BLACK SCALE (Saissetia oleae) in 51 (norm 34) percent of groves; 24 (norm 11) percent economic. Above normal and at moderate level. Decrease expected. High in central, east, and west districts and very low in north and south districts. YELLOW SCALE (Aonidiella citrina) in 44 (norm 57) percent of groves; 1 (norm 8) percent economic. CHAFF SCALE (Parlatoria pergandii) in 43 (norm 46) percent of groves; 1 (norm 4) percent economic. Yellow scale and chaff scale below normal and will remain at low level in all districts. An ARMORED SCALE (Unaspis citri) in 25 percent of groves; moderate or heavy in 15 percent. Will continue near present level which is near record high set in September 1970. Further spread and intensification expected. WHITEFLIES in 74 percent of groves; 2 percent economic. Decreased and now at moderate level although still slightly above normal for November. Further decrease expected. Highest district east. (W.A. Simanton, (Citrus Expt. Sta., Lake Alfred)).

BROWN SOFT SCALE (Coccus hesperidum) - ARIZONA - Heavy in dense 10-acre block of lemons, sooty mold evident, on Yuma Mesa, Yuma County. (Ariz. Coop. Sur.).

AN ARMORED SCALE (Unaspis citri) - FLORIDA - Heavy on 30 percent of 500 nursery grapefruit trees at Groveland, Lake County, November 25. Moderate on 172 lemon trees and moderate on about 10 percent of 3,000 mixed citrus trees in nursery at Groveland December 3. (DeWolf).

CITRUS RED MITE (Panonychus citri) - ARIZONA - Averaged 20.76 per leaf in one lemon grove on Yuma Mesa, Yuma County. (Ariz. Coop. Sur.).

TEXAS CITRUS MITE (Eutetranychus banksi) - ARIZONA - Another infested lemon grove found 5.4 miles south of original find. Counts of 23.76 per lemon leaf in one grove at Yuma, Yuma County. (Ariz. Coop. Sur.).

FOREST AND SHADE TREES

RED-HEADED PINE SAWFLY (Neodiprion lecontei) - MISSISSIPPI - Light on young pine in Perry County. (Sartor).

PINE NEEDLE SCALE (Phenacaspis pinifoliae) - CALIFORNIA - Adults 8 per leaf on cedar trees at Yuba City, Sutter County. (Cal. Coop. Rpt.).

MEXICAN MEALYBUG (Phenacoccus gossypii) - CALIFORNIA - Locally infesting mimosa and pepper-trees at Santa Maria, Santa Barbara County. (Cal. Coop. Rpt.).

MAN AND ANIMALS

SCREW-WORM (Cochliomyia hominivorax) - No cases reported in U.S. December 6-12. Total of 106 laboratory-confirmed cases reported in portion of Barrier Zone in Republic of Mexico as follows: Sonora 71, Chihuahua 26, Coahuila 2, Nuevo Leon 1, Tamaulipas 6. Total of 4 cases reported in Mexico south of Barrier Zone. Barrier Zone is area where eradication operation underway to prevent establishment of self-sustaining population in U.S. Sterile screw-worm flies released: Texas 11,368,000; Mexico 96,972,000. (Anim. Health Div.).

COMMON CATTLE GRUB (Hypoderma lineatum) - OKLAHOMA - Moderate on cattle in Craig County and light in Choctaw County. (Okla. Coop. Sur.).

SHORT-NOSED CATTLE LOUSE (Haematopinus eurysternus) - OKLAHOMA - Cattle lice, mainly this species, light on Craig County cattle. (Okla. Coop. Sur.).

COUNTIES ENTIRELY COLORED ARE COMPLETELY

COUNTIES WITH COLORED DOT ARE PARTIALLY REG

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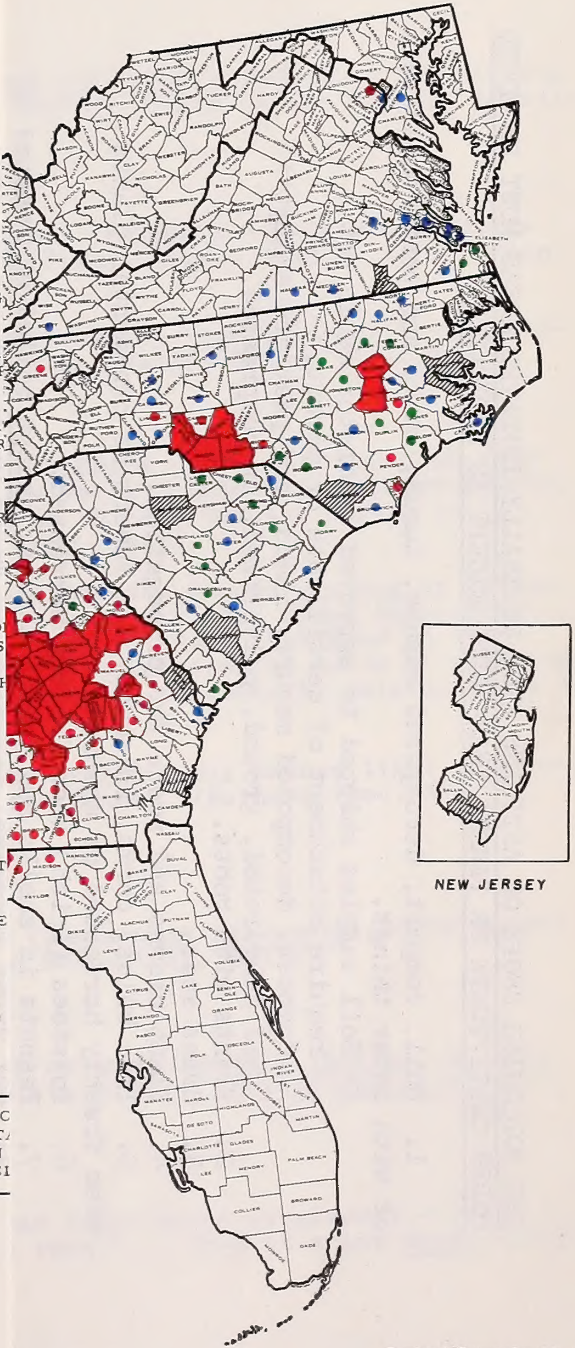
RESTRICTIONS ARE IMPOSED ON THE MOVEMENT O
ARTICLES FROM A REGULATED AREA AS FOLLOWS

1. RED INTO OR THROUGH GREEN, BLUE, OR WH
2. GREEN INTO OR THROUGH BLUE OR WHITE.
3. GREEN INTO GREEN.
4. GREEN WITHIN GREEN°.
5. BLUE INTO ANY OTHER AREA°°.

° WHEN IT IS DETERMINED BY THE INSPECTOR T
OF SPREAD EXISTS.

°°ONLY WHEN REQUIRED BY STATE QUARANTINE
OR BY AN AUTHORIZED INSPECTOR.

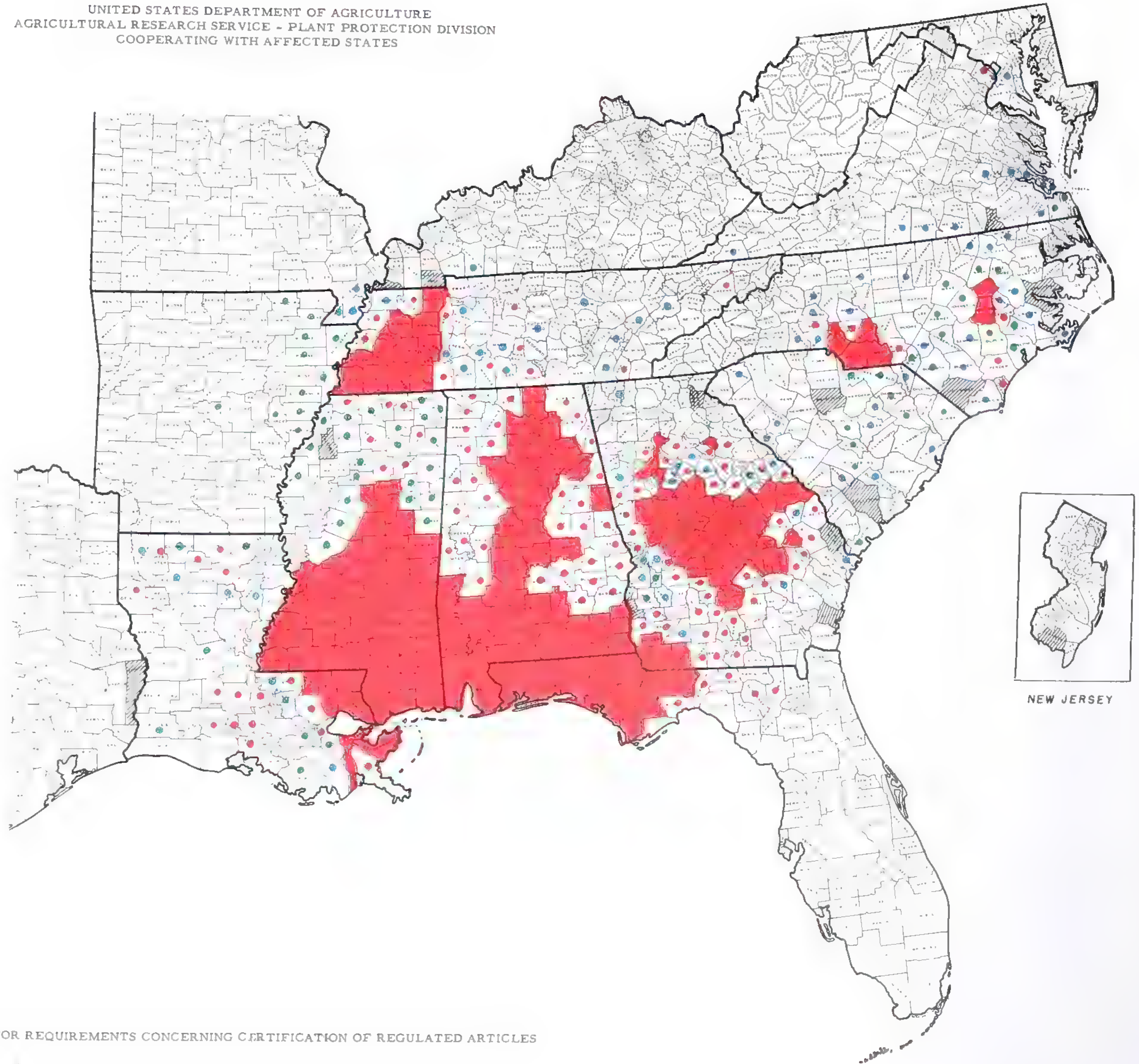


CONSULT YOUR STATE OR FEDERAL PLANT PROTEC
INSPECTOR OR YOUR COUNTY AGENT FOR ASSIST
REGARDING EXACT AREAS UNDER REGULATION
REQUIREMENTS FOR MOVING REGULATED ARTICI

Revised September 25, 1970.

WHITE - FRINGED BEETLE QUARANTINES

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE - PLANT PROTECTION DIVISION
COOPERATING WITH AFFECTED STATES



COUNTIES ENTIRELY COLORED ARE COMPLETELY REGULATED;

COUNTIES WITH COLORED DOT ARE PARTIALLY REGULATED.

🟥 GENERALLY INFESTED AREA--STATE AND FEDERAL REGULATIONS (ERADICATION TREATMENTS NOT IN PROGRESS OR PLANNED.)

🟩 SUPPRESSIVE AREA--STATE AND FEDERAL REGULATIONS. (ERADICATION TREATMENTS APPLIED OR IN PROGRESS.)

🟦 STATE REGULATIONS ONLY. (ERADICATION TREATMENTS APPLIED OR IN PROGRESS.)

▨ ERADICATED--REGULATIONS REMOVED.

RESTRICTIONS ARE IMPOSED ON THE MOVEMENT OF REGULATED ARTICLES FROM A REGULATED AREA AS FOLLOWS:

1. RED INTO OR THROUGH GREEN, BLUE, OR WHITE.
2. GREEN INTO OR THROUGH BLUE OR WHITE.
3. GREEN INTO GREEN.
4. GREEN WITHIN GREEN°.
5. BLUE INTO ANY OTHER AREA°°

° WHEN IT IS DETERMINED BY THE INSPECTOR THAT A HAZARD OF SPREAD EXISTS

°° ONLY WHEN REQUIRED BY STATE QUARANTINE REGULATIONS OR BY AN AUTHORIZED INSPECTOR

CONSULT YOUR STATE OR FEDERAL PLANT PROTECTION INSPECTOR OR YOUR COUNTY AGENT FOR ASSISTANCE REGARDING EXACT AREAS UNDER REGULATION AND REQUIREMENTS FOR MOVING REGULATED ARTICLES.

SEE REVERSE SIDE FOR REQUIREMENTS CONCERNING CERTIFICATION OF REGULATED ARTICLES

Revised September 25, 1970

THE FOLLOWING CROPS OR ARTICLES FROM GENERALLY INFESTED AREAS MUST BE MOVED UNDER CERTIFICATE OR PERMIT YEAR-ROUND EXCEPT AS INDICATED:

1. Soil, compost, decomposed manure, humus, muck, and peat, separately or with other things.

   Soil samples shipped to approved laboratories do not require attachment of certificate or permit.*
   Compost, decomposed manure, humus, and peat are exempt** if dehydrated, ground, pulverized, or compressed.

2. Plants with roots.
3. Grass sod.
4. Plant crowns and roots for propagation.
5. True bulbs, corms, rhizomes, and tubers of ornamental plants when freshly harvested or uncured.
6. Potatoes (Irish) when freshly harvested.
7. Peanuts in shells and peanut shells, except boiled or roasted peanuts.
8. Uncleaned grass, grain, and legume seed.
9. Hay and straw.
10. Seed cotton.

    Seed cotton is exempt if moving to a designated gin.**

11. Scrap metal and junk.
12. Brick, stone, concrete slabs, drainage pipes, and building blocks.

    Brick, stone, concrete slabs, drainage pipes, and building blocks are exempt** if not exposed to infestation in storage or if the storage site has been treated with an approved pesticide.

13. Forest products, such as pulpwood, stumpwood, logs, lumber, and crossties.

    Forest products, such as pulpwood, stumpwood, logs, lumber, and crossties are exempt** if not exposed to infestation in storage or if the storage site has been treated with an approved pesticide.

HOG LOUSE (*Haematopinus suis*) - MISSISSIPPI - Averaged less than one behind each ear on 25 hogs checked at State College, Oktibbeha County. (Sartor).

WINTER TICK (*Dermacentor albipictus*) - OKLAHOMA - Light on Choctaw County cattle. (Okla. Coop. Sur.).

HOUSEHOLDS AND STRUCTURES

EASTERN SUBTERRANEAN TERMITE (*Reticulitermes flavipes*) - ALABAMA - Reoccurring infestation damaged 2 windows, walls, and door of church in Lee County. Repairs and retreatment planned. (Feaster).

BENEFICIAL INSECTS

CONVERGENT LADY BEETLE (*Hippodamia convergens*) - ARIZONA - Larvae and adults averaged 40 per 100 sweeps of alfalfa at Cochise, Cochise County. (Ariz. Coop. Sur.).

VEDALIA (*Rodolia cardinalis*) - ARIZONA - Controlling *Icerya purchasi* (cottony-cushion scale) in one lemon grove at Yuma, Yuma County. (Ariz. Coop. Sur.).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

CARIBBEAN FRUIT FLY (*Anastrepha suspensa*) - FLORIDA - Adults trapped in late November and early December at Melbourne and Merritt Island in Brevard County, Clermont in Lake County, and Daytona Beach in Volusia County. Larvae in calamondins at Clermont December 1. (Fla. Coop. Sur.).

PINK BOLLWORM (*Pectinophora gossypiella*) - ARIZONA - Second picking of cotton December 1 in release field at Redington, Pima County. Gin trash inspection recovered 137 larvae from 9 bales compared with 7 larvae recovered in 1969. (PPD). FLORIDA - Three larvae and one pupa collected from 25 bolls of wild cotton in woods near Tavernier, Key Largo, Monroe County, December 1. Determined by V.H. Owens. (Creamer).

RANGE CATERPILLAR (*Hemileuca oliviae*) - NEW MEXICO - Egg masses light in treated areas at Maxwell and Springer area of Colfax County. (Mathews, Dec. 4).

DETECTION

New County Records - WESTERN BEAN CUTWORM (*Loxagrotis albicosta*) SOUTH DAKOTA - Lawrence, Pennington, Haakon, Jackson, and Bennett (p. 831).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville, 12/4-10, BL - Black cutworm (*Agrotis ipsilon*) 6, fall armyworm (*Spodoptera frugiperda*) 1, granulate cutworm (*Feltia subterranea*) 7.

CORRECTIONS

CEIR 20(45):757, 761. WESTERN CORN ROOTWORM (Diabrotica virgifera) - UTAH - "... This is a new county record." should read "... This is a new *State* record."

THE FOLLOWING CROPS OR ARTICLES FROM GENERALLY INFESTED AREAS MUST BE MOVED UNDER CERTIFICATE OR PERMIT YEAR-ROUND EXCEPT AS INDICATED:

1. Soil, compost, decomposed manure, humus, muck, and peat, separately or with other things.

   Soil samples shipped to approved laboratories do not require attachment of certificate or permit.*

   Compost, decomposed manure, humus, and peat are exempt** if dehydrated, ground, pulverized, or compressed.
2. Plants with roots.
3. Grass sod.
4. Plant crowns and roots for propagation.
5. True bulbs, corms, rhizomes, and tubers of ornamental plants when freshly harvested or uncured.
6. Potatoes (Irish) when freshly harvested.
7. Peanuts in shells and peanut shells, except boiled or roasted peanuts.
8. Uncleaned grass, grain, and legume seed.
9. Hay and straw.
10. Seed cotton.

    Seed cotton is exempt if moving to a designated gin.**
11. Scrap metal and junk.
12. Brick, stone, concrete slabs, drainage pipes, and building blocks.

    Brick, stone, concrete slabs, drainage pipes, and building blocks are exempt** if not exposed to infestation in storage or if the storage site has been treated with an approved pesticide.
13. Forest products, such as pulpwood, stumpwood, logs, lumber, and crossties.

    Forest products, such as pulpwood, stumpwood, logs, lumber, and crossties are exempt** if not exposed to infestation in storage or if the storage site has been treated with an approved pesticide.
14. Used mechanized cultivating equipment and used harvesting machinery.
15. Used mechanized soil-moving equipment.
16. Any other products, articles, or means of conveyance of any character whatsoever, not covered by the above, when it is determined by an inspector that they present a hazard of spread of white-fringed beetles and the person in possession thereof has been so notified.

THE FOLLOWING ARTICLES FROM SUPPRESSIVE AREAS MUST BE MOVED UNDER CERTIFICATE OR PERMIT YEAR-ROUND:

1. Bulk soil.
2. Used mechanized soil-moving equipment.
3. Any other products, articles, or means of conveyance of any character whatsoever, not covered by the above, when it is determined by an inspector that they present a hazard of spread of white-fringed beetles and the person in possession thereof has been so notified.

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* Information as to designated laboratories and gins may be obtained from an inspector.

** Exempt if not exposed to infestation after cleaning or other prescribed handling.

HAWAII INSECT REPORT

Turf and Pastures - GRASS WEBWORM (*Herpetogramma licarsisalis*) damage heavy, larvae 28 per square foot, to pastures of Kikuyu grass at Honomalino, Hawaii. Larvae light to moderate in Bermuda and pangola grasses at Pahoa. Larval activity remains light in pastures on Maui and Oahu; light trap collections at Kaneohe, Waipahu, and Manoa, Oahu, indicate increase in adult populations in these areas. (Au, Yoshioka).

General Vegetables - All stages of TARO LEAFHOPPER (*Tarophagus proserpina*) heavy in 0.5 acre of taro at Waianae, Oahu; nymphs and adults of *Tytthus mundulus* (cane leafhopper egg sucker) heavy amid leafhopper populations. Larvae of BEET ARMYWORM (*Spodoptera exigua*) light, average 1 per plant, in 0.5 acre of green onion at Waianae, Oahu. Specimens of BEAN FLY (*Melanagromyza phaseoli*) recovered from field collected yardlongbean and snap bean material at Puunene, Waikapu, and Makawao, Maui, during December yielded parasitism by *Opius* sp. of 25, 64, and 45 percent, respectively. Remains negligible in commercial snap bean and soybean plantings at Waimanalo, Oahu. (Miyahira, Kawamura).

Man and Animals - Large numbers of CLUSTER FLY (*Pollenia rudis*) noted at Kilohana Checking Station, Saddle Road, Hawaii; clusters observed at large and inside buildings; moderate under similar conditions at Hawaii Volcanoes National Park and Kahua Ranch, Hawaii. (Wall, Hernandez, Matayoshi). VEXANS MOSQUITO (*Aedes vexans nocturnus*) numbered 367 and SOUTHERN HOUSE MOSQUITO (*Culex pipiens quinquefasciatus*) 2,527 in 55 light traps operated on Oahu during November. *Aedes* up to 154 per trap at Punaluu. *Culex* up to 309 per trap at Kahana. (Mosq. Contr. Br., Dept. of Health).

Beneficial Insects - Adults of a SCIOMYZID FLY (*Sepedon sauteri*) light on stems and leaves in 0.5 acre of taro at Waianae, Oahu. Original release of this liver fluke predator made in area in March 1967. (Kashiwai). Nymphs and adults of a LADY BEETLE (*Azya luteipes*) preying on crawlers of *Coccus viridis* (green scale) infesting Indian pluchea (*Pluchea indica*) at Enchanted Lake, Oahu. (Kashiwai).

Miscellaneous Pests - Destroyed 500 GIANT AFRICAN SNAIL (*Achatina fulica*) specimens during November at Poipu and 2 at Wahiawa, Kauai. Poison bait application increased to cope with increased snail activity. (Sugawa). Nymphs and adults of a MESOVELIID BUG (*Mesovelia mulsanti*), a predactions water treader, observed at Enchanted Lake, Oahu; first reported at Waipio in 1933. (Kashiwai, Dec. 4).

Weather of the week continued from page 830.

Subzero temperatures occurred in northern Minnesota Thursday morning with minus 15° at International Falls. While bitter cold weather moved into the North, southerly breezes brought near record warmth to the Southland. Macon, Georgia, registered 78° Thursday afternoon. The weekend brought cooler weather to the East. Greenville, South Carolina, cooled to 30° Sunday morning, 25° cooler than on Saturday. Minimums in the central Rocky Mountains dropped to below zero with minus 15° at Big Piney, Wyoming, and minus 1 at Alamosa, Colorado. (Summary supplied by Environmental Data Service, ESSA.)

TECHNIQUES TO DETERMINE LOSSES

Selected References 1967-1970 1/

Part VII

Additional copies of Parts I through VII of this bibliography are available from Economic Insect Survey and Detection.

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Heliothis zea

1/ Citations for 1929, 1930, 1939, 1942, 1944, 1949, and 1951 are included at the end of this list.

* *

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